

over the States in early days, but has since been supplanted, as in England, by the brown rat (*M. decumanus*). Forty years ago the black rat was the only rat in South-west Ohio. About thirty years ago the brown rat drove him out. Some years later the same occurred in Illinois. I have been informed by one of my students living in Minnesota, that neither rat is known in and about the town of St. Cloud in that state, only one having ever been seen there, and that was killed on landing from a steamer. I have seen it stated that the black rat is still to be found in some localities in England, among them the White-chapel Docks.

E. W. CLAYPOLE

Antioch College, Ohio, April 7

Did Flowers Exist during the Carboniferous Epoch?

I CANNOT accept Mr. McLachlan's reference of the interesting *Breyeria boriniensis* to the Ephemeroidea, even though he has "examined the fossil," and "has no doubt" about it. The photograph which I possess is so beautifully sharp that it brings out the minutest details, and a careful examination and comparison of it with specimens and drawings leads me to the conclusion, that in the general character of the wing-neruration it is strictly lepidopterous and of the Bombycine type, having the costal, subcostal, and median nervures, with their branches and bifurcations, arranged precisely as in that group, but differing in the much greater length of the wing and the increased number of the branches of the subcostal vein—seven instead of four. In some of the Chalcosiidae, however, there are often six branches to this vein, but crowded together and sometimes anastomosing, owing to the much shorter apical portion of the wing. In this family also we often have an intermediate false vein, which is distinctly visible in the fossil. Until, therefore, I am referred to some group of insects with which it more nearly agrees, I must believe it to be an ancestral moth, even though, according to Prof. Haeckel and Mr. Scudder, moths ought not to have existed in the carboniferous epoch.

After a careful comparison of the photograph with specimens and figures of Ephemeroidea, I can see no resemblance whatever to the neruration of the family with which Mr. McLachlan so confidently associates it; while the "dense transverse reticulation" to which he refers seems to me to be merely due to crumpling of the membrane, and certainly bears no close resemblance to the strong reticulation of the veining of the Ephemeroidea, and it is, moreover, only visible at all at the base of the wing. The general form of the wing and arrangement of the veins are, however, so different, as, to me, to be conclusive against this view.

ALFRED R. WALLACE

Blue Flame from Common Salt

At the present time any spectroscopic observations of coloured flames are peculiarly interesting, and I am glad to see the origin of the blue or violet flame produced by common salt and other chlorides again discussed in your pages.

In the letter of Mr. Percy Smith (*NATURE*, vol. xix. p. 483), he considers the only feasible explanation to be "that it is due simply to hydrochloric acid," but he gives no proof, and admits that a spark between carbon points in a bottle of this gas does not give the violet bands. In a short paper on the subject in the *Philosophical Magazine* of December, 1862, I considered "this supposition is negated by the fact that anhydrous chloride of copper emits these rays equally whether it be placed in a flame of hydrogen or of pure bisulphide of carbon." Neither does this characteristic flame seem due to any carbon compound, inasmuch as several chlorides will give it in a hydrogen flame. I also found that "a stream of chlorine or hydrochloric acid passed into a flame never gives the violet light, nor does Dutch liquid, muriatic ether, or chloroform mixed with alcohol and burnt in a spirit lamp," though chloride of platinum or gold give a flash of it at that temperature.

Would Mr. Smith favour us with any details of his experiments which may support his conclusion?

17, Pembroke Square, April 10

J. H. GLADSTONE

Cape Diamonds

At the Croydon County Court a lady sought to recover 36*l.* 15*s.* paid for a ring, the stone in which had been represented

to be a diamond, and which was indeed admitted to be a Cape diamond.

Judgment was given for the plaintiff, because several diamond dealers gave evidence which, the judge stated, clearly showed that what were described as "Cape diamonds" were not at all to be regarded as ordinary diamonds, and the receipt showed that the ring was sold as a diamond ring. The "several diamond dealers" stated that so-called Cape diamonds were comparatively valueless and lacked the essential qualities of the Brazilian stones, viz., lustre, hardness, and colour.

Now all this is beside the question, which was not as to the value of Cape diamonds, nor yet what they lacked of the qualities of the Brazilian stone, but simply whether this stone was a diamond or not, not even whether it was or was not an ordinary diamond, and I am surprised that any judge could be thus led away from the legal point.

I see that notice of appeal has been given, and it is to be hoped for the credit of elementary science that the court above will require some scientific evidence, such as specific gravity or chemical composition, about Cape diamonds. If, for instance, it can be shown that they are a form of carbon, the point is settled.

It would be just as absurd for a person to object to Derby coal as not coal because it lacked the good qualities of Wallend. The ring was sold as a diamond ring; the question is: Is the stone a diamond?

I have no personal interest whatever in the matter. I know nothing of the case except as it appears in the report. I possess no diamonds, not even a "Cape"; but I am interested in seeing justice administered with some regard to the scientific knowledge of the day.

B. G. JENKINS

April 14

Sense of Temperature

YOUR correspondent J. T. B. asks for further instances of the cultivation of the sense of temperature. None can be more striking than that of the caste of egg-hatchers in Egypt, who determine the temperature in their ovens entirely without the aid of instruments, and maintain it at 100° to 103° Fahr. during the requisite three weeks. How successful they are is shown by the official return for 1831, given by Lane ("Modern Egyptians," London, 1842, vol. 2, p. 5, *et seq.*) from whom I take these particulars. Out of a total of 26,204,500 eggs artificially incubated, 17,418,973 were successfully hatched.

April 19

ALFRED H. HUTH

Tides at Chepstow

THE highest tides in the Wye and in the Severn for the present year were on Tuesday, April 8. On that day, up the Wye, at Llandogo, the tidal rise was 13 feet; at Tintern Abbey, 21 feet 5 inches; at Chepstow Railway Bridge, 44 feet. Up the Severn, at Newnham, the tidal rise was 20 feet; at Portskewitt, 46 feet 6 inches; at Cardiff, 44 feet; at Clevedon Pier, 52 feet.

Reference to Cox's "Historical Tour in Monmouthshire," 4th Edition, 1801, p. 358, containing his own soundings at high tide, on September 4, proves that there has been no perceptible change in the depth of the Wye at high tide this century.

The Severn has been confined within narrower limits by the South Wales Railway embankment, on the Monmouthshire side, since 1850, and by Lord Fitzhardinge's breast-works on the Gloucestershire side, from about same date, but the height of the tide and the depth of the river have not been sensibly affected by these slight alterations. One fact further may be worth mention, however: a gun-boat or armed sloop, commanded by Capt. White, came up the "Pill," below St. Pierre, in 1827, on a surveying expedition, remained at anchor some days, and re-entered the Severn without difficulty, piloted by W. Wheeler, a thing that would now be impossible on account of the embankments. The Pill is a mere creek—the "anchorage," dry ground.

JOHN YEATS

OUR ASTRONOMICAL COLUMN

BORSÉN'S COMET.—The following ephemeris of this comet for May is deduced from Dr. Schulze's elements, with the time of perihelion passage corrected so as to accord better with the observations in March at Florence and Kremsmünster. The heliocentric co-ordinates, referred to apparent equinox of May 1, for combination

with the x, y, z of the *Nautical Almanac*, have been found from—

$$\begin{aligned} x &= r[9.94281], \sin. (v + 207^\circ 51'8), \\ y &= r[9.98498], \sin. (v + 126^\circ 18'6), \\ z &= r[9.73737], \sin. (v + 60^\circ 32'2). \end{aligned}$$

Ephemeris for Greenwich Midnight

1879.	Right Ascension. h. m. s.	North Declination.	Log. distance from Earth.	Log. distance from Sun.
May 1 ...	5 45 30	59 42'0		
2 ...	5 57 36	60 38'4	9.8459	9.9366
3 ...	6 10 31	61 30'5		
4 ...	6 24 10	62 17'8	9.8422	9.9494
5 ...	6 38 31	63 0'1		
6 ...	6 53 37	63 36'4	9.8395	9.9621
7 ...	7 9 19	64 6'7		
8 ...	7 25 30	64 30'5	9.8381	9.9745
9 ...	7 42 5	64 47'3		
10 ...	7 58 55	64 57'1	9.8379	9.9866
11 ...	8 15 50	64 59'5		
12 ...	8 32 41	64 54'9	9.8388	9.9984
13 ...	8 49 16	64 43'3		
14 ...	9 5 28	64 24'9	9.8409	0.0100
15 ...	9 21 11	64 0'2		
16 ...	9 36 19	63 29'6	9.8441	0.0213
17 ...	9 50 46	62 53'5		
18 ...	10 4 30	62 12'4	9.8484	0.0323
19 ...	10 17 28	61 27'0		
20 ...	10 29 39	60 37'8	9.8538	0.0430
21 ...	10 41 5	59 45'2		
22 ...	10 51 49	58 49'7	9.8602	0.0535
23 ...	11 1 52	57 51'9		
24 ...	11 11 16	56 52'1	9.8675	0.0637
25 ...	11 20 5	55 50'6		
26 ...	11 28 20	54 48'1	9.8757	0.0736
27 ...	11 36 4	53 44'9		
28 ...	11 43 18	52 40'6	9.8848	0.0833
29 ...	11 50 5	51 36'2		
30 ...	11 56 28	50 31'8	9.8942	0.0927
31 ...	12 2 28	49 27'6		

THE DOUBLE-STAR, SOUTH 190.—Interest attaches to this object for more than one reason. The principal star possesses a large proper motion in which the companion participates, while there is a much slower change of relative position in the same way that we observe in 61 Cygni. Further, there would appear to be some evidence of variability of light in the principal star. Argelander in his memoir on the proper motions of 250 stars, assigns $+0.069$ in right ascension, and -1.766 in declination, or 2.015 annually in arc of great circle, in the direction $151^\circ 14'$. If we compare Lalande's observation on May 22, 1798, with the observations made at Bonn in 1864, and at Washington 1867–69, almost identical values with those given by Argelander will result. The following figures will sufficiently indicate the variation in relative position that has occurred since Piazzi observed the star early in the present century:—

Piazzi ...	1806.7	Position 251.4	Distance 9.40
Herschel and South ...	1823.32	" 270.1	" 10.82
Herschel (Cape Obs.).	1836.46	" 277.4	" 12.08
Jacob ...	1856.37	" 284.0	" 13.35
Stone (Cincinnati) ...	1877.37	" 290.3	" 14.92

The star forms one of Sir W. Herschel's catalogue of 145 new double stars, where the duplicity is stated to have been discovered in 1785; at the epoch 1791.39 the angle was estimated 270° —, distance IV.; an observation not easily reconciled with more recent ones.

As regards variability the principal star was rated 4m. in Argelander's zone No. 295, on May 20, 1850; it is 5.9m. in the second Radcliffe catalogue, while the Washington observers call it 6.6m.; Lalande and Piazzi estimated it 6m. Argelander calls the companion 8.4. The position of South 190 for 1880 is in R.A. 14h. 50m. 27s., N.P.D. $110^\circ 52'3$. It is No. 1186 in the Greenwich catalogue for 1860.

THE MINOR PLANET HILDA.—This small planet, the most distant member of the group, which approaches the

orbit of Jupiter within 0.85 of the earth's mean distance from the sun, has been sought for unsuccessfully at Berlin, near the calculated position; there may now probably be a difficulty in recovering it.

GEOGRAPHICAL NOTES

WE hear that Sir Walter C. Trevelyan, who died lately at Wallington, Northumberland, has bequeathed to the Royal Geographical Society, of which he had been for many years a trustee in conjunction with Lord Houghton, the sum of 500*l.*, in addition to a valuable collection of books relating to the Faroe Islands, maps, &c.

THE geographical haze in which some of our daily contemporaries persist in enveloping themselves, appears to be growing denser. The "War at the Cape" is bad enough, but the telegram received last week from a special correspondent at Baku, informing a wondering public that "Krasnovodsk has returned with General Lazareff, and Lomakine's reconnaissance to the confluence of the Attrek and Sumbir [*sic*], &c.," fills the cup to overflowing. Krasnovodsk, we thought, was the name of a town and bay on the eastern shore of the Caspian, but the tangle is above our powers to unravel.

THE new part of the *Transactions* of the Asiatic Society of Japan is wholly occupied with Mr. John Milne's narrative of his journey across Europe and Asia to the Land of the Rising Sun. From some singular statements which he makes, we suspect that Mr. Milne was not sufficiently careful in making himself acquainted with the literature of Chinese travel before leaving; otherwise he would hardly venture to assert that the journey from Peking to Tientsin and overland to Shanghai has but seldom been made by Europeans. Mr. Milne's views on the subject of the rendering Chinese sounds are very remarkable.

THE Paris Society of Geography held its annual meeting for the election of officials on Friday, April 18. Admiral Laroncière le Nourry was returned president almost without opposition. The great gold medallist is Lieut. de Brazza, the Ogowe explorer. A gold medal was also awarded to Lieut. Wyse, of the French Navy, for his exploration of the Isthmus of Darien, for the construction of an inter-oceanic canal. The gold medal for Polar exploration was awarded to Sir George Nares, Commander of the last English Arctic Expedition. The Cross of the Legion of Honour was also given to M. Brazza and his fellow-explorer, Dr. Ballay. Lieut. Wyse and Lieut. Reeks received a similar honour for the Darien explorations. An address was given by Commander Perrier on the determination of longitudes by electricity. A map was distributed amongst members showing all the European and African towns whose longitudes have been determined by that process. They number about one hundred, extending from Oural to Valentia, and from Lapland to Sahara.

NO. 3 of this year's *Mittheilungen* of the Vienna Geographical Society contains an important paper, with map, on the sources of the Dniester and the valley-structure of the region of the Upper Dniester and Strwacz. The first number of this year's *Boletín* of the Madrid Geographical Society contains, among other things, the first part of an account of an excursion in the La Plata Republics, by Capt. Carrasco y Guisasaola.

THE just published *Bulletin* of the Antwerp Geographical Society contains, amidst a considerable variety of matter, a paper by Mme. Dumas de Baiglie, entitled "Les Voyageuses illustres." The Society about a year ago resolved to admit ladies, and the author of this paper is a *membre associé*, who seems very grateful for this recognition of the rights of women.

AMONG the new bills introduced into the first session of the Forty-sixth U.S. Congress is one authorising the president to establish a temporary colony at some point north